BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of

Modernizing the E-rate Program for Schools and Libraries	WC Docket No. 13-184

COMMENTS BY CONNECTED NATION, INC.

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SUMMARY

Connected Nation, Inc., a nationwide not-for-profit with the mission of expanding the access, adoption, and use of broadband technology, strongly supports the Commission's initiative to significantly transform the E-rate program. The E-rate program, by and large, has not seen a fundamental reassessment since its inception in 1997 – when school and library connectivity to even basic Internet services was the exception, not the rule. Today, with broadband and mobile technology poised to transform the way students learn, teachers teach, and libraries serve their patrons, the question for this proceeding is not whether the E-rate program needs a substantial transformation – the question is whether the Commission will be bold enough in its approach to establish new priorities for the E-rate program that matches these revolutionary opportunities.

In Section I of these Comments, Connected Nation outlines the broadband challenges that the nation's libraries and schools face today. This discussion is shaped by findings from Connected Nation's survey of thousands of libraries and schools in nine states and the territory of Puerto Rico, as part of the NTIA State Broadband Initiative grant program. These findings show that there are substantial gaps in high-speed connectivity at 100 Mbps in these institutions among states. Moreover, these high-speed broadband gaps are greater in rural areas and areas with lower income residents. These findings support a national initiative to substantially increase library and school connectivity to high-speed broadband networks.

In Section II, Connected Nation recommends that the Commission establish priorities funding high-speed broadband connections to school and library buildings, wireless local area networks within those campuses, and mobile wireless broadband access to educator and student

devices. As schools migrate from textbooks to tablets, to maximize their educational effectiveness these devices need to be connected to the Internet when the student is using them – in any location. The Commission should not categorically exclude from E-rate funding all school-to-home mobile broadband and instead should prioritize such access as an efficient and effective method of leveraging information technology to improve educational achievement.

In Section III, Connected Nation outlines a method in which the Commission may incentivize coordination of the E-rate program with other state and national broadband infrastructure initiatives, such as the NTIA Broadband Technology Opportunities Program and the Connect America Fund, by encouraging the use of community technology plans. Such coordination offers potential for significant cost savings in network construction costs, as the National Broadband Plan recognized. The Commission can incentivize community technology planning initiatives by awarding an additional discount to applicants in communities that engage in this type of coordinated community planning.

Finally, in Section IV, Connected Nation outlines a number of proposals with regard to data collection, release, and visualization by the Commission and USAC that Connected Nation believes will result in a more cost-effective and efficient E-rate program. At the center of many of the Commission's proposals in Section IV of the *Notice* is the question of information and data. Connected Nation believes that improved access to how E-rate funds are being used, and the cost of those services, can be a very powerful tool in ensuring cost-effectiveness. Many of these proposals can be adopted without requiring more information from applicants.

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Sixteen years have passed since the Commission first established the E-rate program, and while program rules have changed and evolved since 1997, the Commission has not fundamentally reassessed the original structure and initial priorities. With broadband technology and mobile devices poised to transform education inside classrooms and libraries, training generations of lifelong learners in both basic and advanced digital skills, the Commission is correct in its belief that "the E-rate program must evolve to meet the current and future needs of schools and libraries."[1] If the past is prologue, this proceeding will likely establish the future framework for the E-rate program for a decade or more – to succeed in this effort, the Commission must look forward and be transformational in its vision, bold in its approach.

Connected Nation, Inc., a leading technology not-for-profit corporation, is devoted to increasing broadband deployment, adoption, and utilization, and supports the Commission's goal of modernizing the E-rate program. Since its founding over ten years ago, Connected Nation has worked with thousands of schools, libraries, states, local leaders and stakeholders, and

[1] *Notice* at ¶ 9.

individuals across the United States to expand the reach and use of high-speed broadband. Committed to bringing broadband-enabled resources to all Americans and experienced in digital inclusion directives, Connected Nation is pioneering the paradigm shift from broadband simply as a matter of connectivity to an elemental component of modern education, employment, and community prosperity. From a program in Ohio that mobilized nearly 300 libraries and community colleges statewide in an extensive digital literacy training campaign,[2] to its most recent education initiative, Edified, Connected Nation has been active in closing broadband access, adoption, and use gaps in our nation's libraries and schools.

In addition to its direct work with libraries and schools, Connected Nation is also a key source of information on library and school broadband connectivity. Through the State Broadband Initiative (SBI) grant program[3] and the Broadband Technology Opportunities Program (BTOP),[4] both managed by the Department of Commerce, National Telecommunications and Information Administration (NTIA), Connected Nation's nonprofit subsidiaries collect, process, and validate information on the availability of broadband to institutions in nine states and the Territory of Puerto Rico, and promote broadband development

[2] Connected Nation subsidiary, Connect Ohio introduced "Every Citizen Online" in December 2010, funded thanks to a BTOP grant to increase sustainable broadband adoption. The program provides instruction on basic computer and Internet utilization. *See* CONNECT OHIO, ABOUT EVERY CITIZEN ONLINE, http://connectohio.org/every-citizen-online (last visited Sept. 11, 2013).

[3] *See* NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION, STATE BROADBAND INITIATIVE http://www.ntia.doc.gov/category/state-broadband-initiative (last visited Sept. 16, 2013).

[4] *See* NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION, BROADBAND TECHNOLOGY OPPORTUNITIES PROGRAM, http://www.ntia.doc.gov/category/broadband-technology-opportunities-program (last visited Sept. 16, 2013).

and adoption, particularly in traditionally unserved or underserved regions through training and awareness campaigns.[5]

In Section I of these Comments, Connected Nation summarizes the challenging broadband landscape that the nation's libraries and schools now face, based upon Connected Nation's experience working directly with these institutions and through the broadband data collected as part of the NTIA SBI grant program. In Section II, Connected Nation recommends that, to take advantage of the educational opportunities of broadband and mobile technologies, the E-rate program should prioritize high-speed broadband Internet access at schools and libraries to support emerging technology-based learning models. In Section III, Connected Nation proposes that the Commission recognize and promote coordinated, community technology planning that can lower infrastructure network construction costs and provide other benefits. Finally, in Section IV, Connected Nation recommends that the Commission and the Universal Service Administrative Company ("USAC") provide E-rate applicants and the public a host of new data tools and capabilities that will generate cost savings and facilitate efficient purchasing decisions.

I. THE BROADBAND CHALLENGE FOR THE NATION'S LIBRARIES AND SCHOOLS

Libraries and schools are leading the broadband transformation across the nation. Broadband is rapidly transforming American society, and the nation's schools and libraries have been heroically shouldering much of the burden of training youth and adults to use and take advantage of the opportunities of broadband and digital technologies.

[5] *See* http://www.connectednation.org/programs (listing states and containing links).

Long gone are the days when library resources were limited to books and other print materials. Libraries today serve as clearinghouses for the endless amount of information, tools, and services available on the Internet and catalysts for broadband adoption. Virtually all public libraries in the United States offer public access to the Internet, and more than ninety percent of libraries offer formal or informal point-of-contact technology training.[6]

Connected Nation has witnessed this transformation in the years since it first started partnering with state and local libraries.[7] Libraries across the nation are stepping up to meet the needs of those lacking broadband access, the ability to afford home or personal subscriptions to the service, or the knowledge necessary to effectively use this technology.

Every day, more than 300,000 Americans receive job search assistance at a local public library.[8] Over 80% of Fortune 500 companies now require online job applications and only post job openings online.[9] Government service applications too are becoming digitized. More than ninety-six percent of libraries report providing assistance with e-government services.[10]

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[6] Ninety-one percent of libraries offer Wi-Fi connectivity. Public Library Funding & Technology Access Study, *U.S. Public Libraries Weather the Storm*, AMERICAN LIBRARY ASSOCIATION 1, 2 (2012),http://www.ala.org/research/sites/ala.org.research/files/content/initiatives/plftas/issuesbriefs/issuebrief-weatherstorm.pdf.

[7] In 2008, Connected Nation and the American Library Association, with support from the Bill and Melinda Gates Foundation, launched a pilot broadband initiative focused on improving and sustaining Internet connectivity to public libraries. These programs helped launch BTOP Sustainable Broadband Adoption programs. Press Release, Bill & Melinda Gates Foundation, Pilot Grant Program to Improve Internet Connections in Public Libraries (Dec. 18, 2008) *available at* http://www.gatesfoundation.org/Media-Center/Press-Releases/2008/12/Improving-Internet-Connections-in-Public-Libraries.

[8] *Public Libraries Weather the Storm* at 3, http://www.ala.org/research/sites/ala.org.research/files/content/initiatives/plftas/issuesbriefs/issuebrief-weatherstorm.pdf.

[9] FEDERAL COMMUNICATIONS COMMISSION, CONNECT AMERICA FUND (2013) http://www.fcc.gov/encyclopedia/connecting-america.

[10] *Public Libraries Weather the Storm* at 4.

From access to job postings to completing online benefit applications, libraries have become a vital lifeline for millions of American who would otherwise be disconnected. Approximately 62% of library branches report being the sole provider of free public access to computers and the Internet within their community.[11] Connected Nation research shows that 18% of adults (or an estimated 42 million nationally) access online information through their local library. The library is a key avenue for broadband access for millions of low-income Americans. An estimated 19% of Americans earning less than $25,000 annually use the library to access online services. Among American adults who do not have home broadband service, 15% report using the local library to access online services.[12]

Broadband access, adoption, and use gaps are also present in the education sector. Recognizing this from its work in communities, in 2013 Connected Nation launched its newest initiative, Edified. Edified collaborates with technology companies, education research organizations, broadband providers, and educators to increase the deployment of mobile technology, robust wireless connectivity, education applications, and twenty-first century teaching practices in America's K-12, college, and university settings.[13] Edified promotes technology solutions that have the potential to revolutionize learning and education outcomes.

In Section II of the *Notice*, addressing goals and measures, the Commission requests information as to how schools' bandwidth needs are changing, particularly in schools launching

[11] PUBLIC LIBRARIES & THE INTERNET, BROADBAND & PUBLIC LIBRARIES http://www.plinternetsurvey.org/analysis/public-libraries-and-broadband. (last visited Sept. 12, 2013).

[12] CONNECTED NATION. CONSUMER BROADBAND ADOPTION TRENDS, http://www.connectednation.org/survey-results/residential (last visited Sept. 16, 2013).

[13] Edified's objective is to have a measurable impact on supplementing efficiencies in solving the connectivity challenge, and drive a more effective learning environment for students.

one-to-one device initiatives.[14] Technology available to students on a one-to-one basis has the power to "edify" the quality of the educational experience at all levels from a kindergarten classroom to an advanced degree setting, regardless of school type or demographic composition. Robust broadband connectivity paired with modern technology devices and twenty-first century pedagogy has the potential to dramatically transform education in America.

Just as libraries are no longer limited to print materials, schools are expanding beyond the classroom-restricted paper-and-pencil based methods of the past by instituting anytime, anywhere digital learning programs.[15] A survey by the PEW Internet and American Life Project reveals that over seventy-five percent of teachers currently ask students to access and submit school assignments online.[16] However, the direction of modern education will require more than a simple upload and submit feature. Approximately eighty-four percent of school districts across the United States would be interested in launching a one-to-one initiative within the next two years.[17] The concept of a one-to-one program has consistently been framed to include a device for each student, and both on- and off-campus connectivity. However, only twelve percent of schools have been able to implement such programs to date.[18] Expansion of digital learning models is often halted due to insufficient resources and the fact that many students simply do not have sufficient at-home access - only one-fifth of elementary- and secondary-school teachers in

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[14] *See Notice* at ¶ 24.

[15] *See* Digital Learning Now, *Digital Learning Report Card*, 1, 7-10 (2012) http://www.digitallearningnow.com/wp-content/uploads/reportcard/2012/2012ReportCard.pdf.

[16] Kristen Purcell, Alan Heaps, Judy Buchanan, Linda Friedrich, *How Teachers are Using Technology at Home and in Their Classrooms*, PEW INTERNET AND AMERICAN LIFE PROJECT, *available at* http://www.pewinternet.org/Reports/2013/Teachers-and-technology/Summary-of-Findings.aspx.

[17] Currently, twelve percent of school districts have launched 1:1 programs. Joshua Bolkan, *Report: Most District Tech Leaders Want 1:1 Deployment or Expansion*, THE JOURNAL (July 18, 2013), http://thejournal.com/articles/2013/07/18/report-most-district-tech-leaders-want-11-deployment-or-expansion.aspx.

[18] *Id.*

the United States report that their students have access to the Internet and other digital technologies at home.[19] The success of the national initiative to expand digital learning – both inside and outside the classroom – will therefore require closing existing connectivity caps.

Mobile online devices in each student's hand and interactive, engaging content will undoubtedly require much greater bandwidth to schools than is utilized today. The target that 99% of America's schools will have broadband speeds of no less than 100 Mbps by 2015, with an ultimate benchmark of 1 Gbps by 2020,[20] will certainly aid in the introduction of such programs. However, as digital learning capabilities expand both in-school and at home, the need for robust broadband connectivity across community anchor institutions rapidly escalates. As a result, understanding the scope and scale of the broadband needs of the nation's schools and libraries is essential to any national initiative to advance digital learning.

Schools and libraries are foundational learning environments and primary locations for reliable online access for millions of Americans. Schools and libraries hold integral roles in closing the digital divide and are uniquely positioned to provide non-adopters with access to a wealth of resources and opportunities. Their importance, however, does not prevent the great disparities that remain in broadband connectivity to these institutions across the nation.

Connected Nation collects school and library survey data as part of the NTIA's SBI grant program. Under this program, state agents are charged with generating inventories of broadband

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[19] Purcell, et al., *How Teachers are Using Technology at Home and in Their Classrooms*, http://www.pewinternet.org/Reports/2013/Teachers-and-technology/Summary-of-Findings.aspx.

[20] *See Notice* ¶ 7, THE WHITE HOUSE, CONNECTED: PRESIDENT OBAMA'S PLAN FOR CONNECTING ALL SCHOOLS TO THE DIGITAL AGE (2013) *available at* http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf.

availability at a granular data –data which feeds the National Broadband Map[21]—and collecting information regarding broadband connectivity across community anchor institutions. These data demonstrate significant gaps in high-speed broadband connectivity in libraries and schools, both between states and within states.

Table 1. Estimated Percentage of Institutions with Download Speeds of 100 Mbps or Greater

Jurisdiction	Schools	Libraries
Alaska	11%	<1%
Iowa	7%	2%
Michigan	38%	3%
Minnesota	1%	<1%
Nevada	54%	<1%
Ohio	66%	1%
Puerto Rico	<1%	<1%
South Carolina	47%	7%
Tennessee	37%	1%
Texas	23%	10%
All 10 Jurisdictions	*34%*	*3%*

As these tables show, there is significant variation in high-speed broadband at schools and libraries. On average, only thirty-four percent (34%) of schools surveyed report download broadband connections of 100 Mbps or above.[22] Very few libraries meet the goal of 100 Mbps download speeds. On average, only three percent (3%) of libraries surveyed in these states meet this threshold.

[21] *See* http://broadbandmap.gov/ (providing address search).

[22] Connected Nation, Examining School and Library Broadband Connectivity: A Connected Nation Policy Brief (July 19, 2013), http://www.connectednation.org/sites/default/files/bb_pp/connected_assessment_policy_brief_final.pdf ("Policy Brief").

These data show that the average school and library has about the same connectivity as the average American home, placing the severity of the broadband gap across many schools and libraries into context.[23] While the average family size has remained less than three people in recent years, the average classroom size frequently exceeds 20 pupils per classroom and long queues routinely form as library patrons wait for an available computer and the chance to get online.[24] The majority of schools and libraries simply do not have the bandwidth necessary to meet their current or future needs.

Table 2. Estimated Percentage of Institutions with Download Speeds of 100 Mbps or Greater

	Schools		Libraries	
	Rural	**Non-Rural**	**Rural**	**Non-Rural**
Alaska	5%	45%	<1%	<1%
Iowa	4%	13%	1%	2%
Michigan	37%	42%	3%	4%
Minnesota	1%	<1%	<1%	<1%
Nevada	12%	70%	<1%	<1%
Ohio	62%	71%	<1%	3%
Puerto Rico	<1%	<1%	<1%	<1%
South Carolina	46%	50%	5%	10%
Tennessee	29%	45%	<1%	1%
Texas	8%	61%	6%	12%
All 10 Jurisdictions	*23%*	*53%*	*2%*	*4%*

[23] *Id.*

[24] *See* U.S. Census Bureau, *America's Families and Living Arrangements* (2010) *available at* http://www.census.gov/population/www/socdemo/hh-fam/cps2010.html, *see also* National Education Association, *Rankings & Estimates: Rankings of the States 2011 and Estimates of Schools Statistics 2012* (Dec. 2011) *available at* http://www.nea.org/assets/docs/NEA_Rankings_And_Estimates_FINAL_20120209.pdf at ix – x.

Table 3. Estimated Percentage of Institutions with Download Speeds of 100 Mbps or Greater by County-Level Median Household Incomes				
County-Level Median Household Income	**Schools**		**Libraries**	
	Rural	**Non-Rural**	**Rural**	**Non-Rural**
Less than $15,000	<1%	<1%	<1%	<1%
$15,000 - $24,999	3%	<1%	<1%	<1%
$25,000 - $34,999	26%	16%	1%	<1%
$35,000 - $49,999	26%	62%	2%	4%
$50,000 or more	28%	57%	2%	5%
Average	*23%*	*53%*	*2%*	*4%*

The data also show that school and library connectivity across the selected states varies substantially, ranging from fifty-four percent of schools with 100 Mbps connection in Nevada, to less than one percent of schools in Puerto Rico.[25] Digital divide concerns often parallel other causes for disparity, such as community income and geographical location, urban or rural. Gaps in high-speed connectivity and broadband adoption consistently remain in low-income and rural areas. Community income level is a significant driver of 100 Mbps broadband access to schools. Rural schools and libraries are less likely to subscribe to broadband at speeds of at least 100 Mbps than schools and libraries in non-rural areas with similar household incomes.[26]

Connected Nation strongly supports a robust E-rate program for schools and libraries that prioritizes high-speed broadband connectivity to support their increasing role in the digital era. The Commission should continue to prioritize broadband connectivity to these institutions; without it Americans on the wrong side of the digital divide stand to be further disconnected.

[25] *See Policy Brief*, http://www.connectednation.org/sites/default/files/bb_pp/connected_assessment_policy_brief_final.pdf.

[26] *Id.*

II. THE FCC SHOULD FOCUS E-RATE FUNDS ON SCHOOL AND LIBRARY CONNECTIVITY THAT IS AIMED AT SUPPORTING STUDENT EDUCATIONAL NEEDS AND LIBRARY PATRONS' INCREASING NEED FOR PUBLICLY AVAILABLE INTERNET ACCESS

The reform of the E-rate program is timely and essential - it arises at a time when schools and libraries are undergoing a paradigm shift in the way they educate students and serve patrons, driven by information technology. With this reform, the FCC has a rare opportunity to ensure that the program is supporting twenty-first century student educational needs and library patrons' increasing need for publicly available Internet access.

This opportunity should not be squandered.

Based on past precedent, it is unlikely that upcoming decades will provide another chance for a comprehensive reform of the program. Connected Nation therefore encourages the FCC to be bold and not simply make marginal program changes; the E-rate reform should be comprehensive and forward-looking.

Program reform should not simply aim to meet today's information technology priorities of schools and libraries. It is of critical importance that reforms instead enable the program to adapt and prioritize technology choices that may not yet be widespread, but could be imperative in three, five, or ten years. To ensure this outcome, policymakers need to adjust their "long view" lenses and instill flexibility into the program in order to make present and future technology needs of the classroom and library viable.

The Commission should avoid a review of the E-rate program in isolation. The Commission should instead seek to ensure that the program helps meet the policy agenda

outlined in the National Broadband Plan ("Plan").[27] Processes should also be designed to complement and reinforce other Commission programming, as well as other federal and state programs aimed at addressing the broadband access, adoption, and use challenges across America.

A. E-RATE SHOULD PRIORITIZE HIGH-SPEED BROADBAND TO SCHOOL AND LIBRARY BUILDINGS, CLASSROOM CONNECTIVITY, AND DEVICE WIRELESS ACCESS FOR EDUCATIONAL PURPOSES (NOTICE SECTION III.B)

To meet the technology needs of schools and libraries over the coming decades, the Commission should reform the E-rate program to prioritize funding of high-speed broadband connectivity to schools and libraries; wireless capacity across school premises, particularly fast, robust wireless access in every classroom; and mobile wireless data connectivity for teacher and student devices, which are increasingly used to present and access educational content. This prioritization would help ensure that students at schools and lifelong learners at libraries would have access to the revolutionary educational opportunities that fixed and mobile broadband technologies have to offer. To the maximum extent possible, E-rate should support ubiquitous access to educational content and applications offered by these key community institutions, regardless of time of day or location.

The E-rate program should first and foremost aim to address the acute access gap facing schools and library buildings across the nation. While national statistics on broadband access across schools and libraries remain elusive (see section IV of this Comments for a thorough discussion of this data gap), the discussion in Section I above indicates that schools and libraries

[27] Federal Communications Commission, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN (2010) *available at* http://www.broadband.gov/download-plan/ ("National Broadband Plan").

face a severe gap between actual connectivity and the broadband targets proposed by the FCC in this *Notice* and by the White House in the ConnectED initiative.

As described in Section I above in more detail, Connected Nation's research on broadband connectivity across schools and libraries in the nine states and Puerto Rico indicates that on average only 34% of schools surveyed report download broadband connections of 100 Mbps or above.[28] Very few libraries meet the goal of 100 Mbps download speeds. On average, only 3% of libraries surveyed in these jurisdictions meet this threshold. Connected Nation's data show that the average school and library has about the same connectivity as the average American home. This statistic puts into context the magnitude of the broadband gap across many schools and libraries.[29] While the average family size has remained less than three people in recent years, the average classroom size frequently exceeds 20 pupils per classroom, and long queues are frequently seen in libraries across the nation as patrons wait for a computer to free up in order to get online.[30] The majority of schools and libraries simply do not have the bandwidth necessary to meet their future, let alone current needs.

Connectivity across states, rural status, and community income also varies substantially, ranging from fifty-four percent of schools with 100 Mbps connection in Nevada, to less than one percent of schools in Puerto Rico.[31] Closing these gaps is a national imperative, and as a result,

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[28] *See Policy Brief*, http://www.connectednation.org/sites/default/files/bb_pp/connected_assessment_policy_brief_final.pdf.

[29] *Id.*

[30] *See* U.S. Census Bureau, *America's Families and Living Arrangements* (2010) *available at* http://www.census.gov/population/www/socdemo/hh-fam/cps2010.html, *see also* National Education Association, *Rankings & Estimates: Rankings of the States 2011 and Estimates of Schools Statistics 2012* (Dec. 2011) *available at* http://www.nea.org/assets/docs/NEA_Rankings_And_Estimates_FINAL_20120209.pdf at ix – x.

[31] *See Policy Brief*, http://www.connectednation.org/sites/default/files/bb_pp/connected_assessment_policy_brief_final.pdf.

Connected Nation supports the Commission in prioritizing high-speed broadband services and internal networks at our nation's schools and libraries.

In addition, Connected Nation believes that the Commission should prioritize mobile data access for devices used for educational purposes. Mobile technology enables a host of learning and educational technologies and applications – and also allows access to those applications from virtually any location and at any time. Robust broadband connectivity paired with modern technology devices and twenty-first century pedagogy has the potential to dramatically transform education in America. Technology available to students on a one-to-one device basis has the power to edify the quality of the educational experience at all levels from a kindergarten classroom to an advanced degree setting, regardless of school type or demographic composition. For this model to be effective, however, students and educators need secure, fast and reliable access to online educational content through individual devices both in the classroom or at the library, *and* beyond school or library premises, including at home.

While more fortunate students will be able to rely on home broadband connectivity to accommodate this need, millions of K-12 students cannot.

According to a recent report by the NTIA, an estimated 21% of households with school-age children do not have broadband at home.[32] The digital gap increases among low-income households and children living in rural areas. According to Connected Nation research, an estimated 52% of households with children and income below $25,000 do not have broadband at

[32] National Telecommunications and Information Administration & Economics and Statistics Administration, *Exploring the Digital Nation: America's Emerging Online Experience*, (2013) *available at* http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf at viii.

home.[33] In rural America, an estimated 27% of households with children do not have broadband in the home.[34]

Educators and policymakers are increasingly considering how to address this gap. Put simply, an educational model that relies primarily on online broadband content has at its core one basic assumption: that each educator and student have access to online content 24/7, wherever they may reside, and whatever their household income level might be. If that assumption is not met, educators will have to make the unfortunate choice of either delaying implementation of ubiquitous online education models, or allowing kids to fall behind for lack of access to this essential technology.

Stated simply, the broadband adoption gap could rapidly develop into an educational achievement gap if students, regardless of family circumstance, are not able to access and utilize educational technology and applications both on school premises and beyond schools grounds at home, in the library and wherever else they choose to do homework.

In this proceeding, the Commission should look to the future and allow E-rate funds to be used to fund mobile access to educational software, applications, and services. While schools today may not need to ensure that all student educational devices are connected 24/7, they very likely may soon choose to do so. For this reason, the Commission should ensure that mobile data plans for student and educator online access devices are an allowable service of the E-rate program. Further, if the Commission were to design a model of eligible services that includes

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33 CONNECTED NATION, CONSUMER BROADBAND ADOPTION TRENDS, http://www.connectednation.org/survey-results/residential (last visited Sept. 16, 2013).

34 *Id.*

priority tiers, mobile data connectivity of educators' and student educational devices should be included in the top priority category.

Connected Nation recommends that all other services that are currently eligible under E-rate rules that do not directly support the broadband capacity to the school and library premise, wireless capacity throughout the schools and libraries, and off-campus mobile data connectivity to educational applications, software, and services, should be included in a separate category with a lower funding priority.

III. THE E-RATE PROGRAM SHOULD ENCOURAGE AND REWARD COMMUNITIES THAT DEVELOP CROSS-INSTITUTIONAL BROADBAND ASSESSMENT PLANS, DEMAND AGGREGATION, PUBLIC-PRIVATE PARTNERSHIPS, AND COORDINATION WITH OTHER COMMUNITY INFRASTRUCTURE INITIATIVES AND OTHER STATE AND FEDERAL UNIVERSAL SERVICE PROGRAMS (NOTICE III.C AND III.D, PARTICULARLY PARAS. 163-177, ALSO IV.G PARAS 217-219)

As discussed above, Connected Nation believes that this proceeding is an historic opportunity to transform the E-rate program. This transformation should involve more than simply tweaking the program around the edges and enable fundamental changes that not only ensure that schools and libraries receive the high-speed broadband connectivity that they need, but that they do so in the most cost-effective manner possible.

In paragraphs 164 and 217-19 of the *Notice,* the Commission raises several questions regarding whether it should require applicants to have broadband assessment plans; particularly inquiring whether community actions that aggregate demand or enter into public-partnerships should be prioritized, as well as whether the E-rate process should be coordinated with the Commission's ongoing implementation of the Connect America Fund.

The Commission should incentivize school and library E-rate funding applications that incorporate comprehensive broadband assessment and planning processes that include consideration of demand aggregation where feasible, exploration of public-private partnerships, coordination with other infrastructure initiatives and other state and federally-funded universal service programs. An incentive structure in which E-rate would fund an additional discount on the cost of service (such as 5%) could entice E-rate applicants and the communities that they serve to work together on these broadband assessment plans, without making those plans mandatory. By applying an additional discount for applicants that demonstrate this type of comprehensive community planning, the Commission would encourage schools and libraries to move forward with their broadband infrastructure projects in a low-cost, efficient manner, as opposed to a potentially expensive silo.

In practice, Connected Nation's proposal would give funding applicants the opportunity to demonstrate that their proposed broadband funding (such as an application for construction of a fiber drop) is part of the community's broader technology plan. In the case of a fiber connection, that community plan may indicate that construction of fiber in a particular year is coincident with other infrastructure upgrades in the community (such as road construction) that might offer significant cost savings. Or perhaps the open trench of the proposed fiber will be shared with commercial broadband expansion in the area; or perhaps a wireless tower facility is about to be constructed close to the library campus. In these circumstances, applicants and their communities should be encouraged to work collaboratively and even seek out these opportunities, which could engender significant cost savings in network construction. To incentivize this collaboration, Connected Nation suggests that an additional discount level be

offered to applicants that demonstrate that its E-rate funding application is part of a broader community technology plan.

Connected Nation has over ten years of experience working with communities across the nation that seek to address their broadband gaps. This experience teaches that informed, coordinated, and inclusive community planning and engagement frequently can identify strategies for cost-effective broadband access solutions. Connected Nation has facilitated a number of last-mile infrastructure projects that provide connectivity solutions to community anchor institutions, businesses, and residents in many unserved areas. One key lesson of those initiatives is that communities that **aggregate and coordinate** their demand for broadband infrastructure through community technology planning can **obtain lower-cost access solutions**.

The Commission can recognize the value of these community-wide initiatives by rewarding E-rate applications that demonstrate that the school or library broadband services requested are part of a comprehensive community broadband assessment plan. These plans should include –

- Demand aggregation with other government bandwidth purchases, to the extent feasible;
- Coordination of the E-rate-funded network build-out with other infrastructure projects in the community, such as dig-once policies, open trenching, and rights-of-way, pole, duct, and conduit upgrades; and
- Coordination with other state and federally-funded infrastructure and universal service fund programs that contemplate infrastructure investment, such as the Rural Healthcare Connect Fund, the Connect America Fund, the Mobility Fund and the BTOP Comprehensive Community Infrastructure grant projects.

The goal of this comprehensive community broadband assessment incentive is to encourage communities to take advantage of these opportunities to lower the cost of broadband deployment, particularly fiber optic cable. As noted in the National Broadband Plan,"[t]he

largest element of deployment costs is not the fiber itself, but the placement costs associated with burying the fiber in the ground (or attaching it to poles in an aerial build)."[35] In the Plan, the Commission found these placement costs can account for three-quarters of the total cost of fiber deployment – and that "[s]ubstantial savings can be captured if fiber builds are coordinated with other infrastructure projects in which the right-of-way . . . is already being dug."[36] Because the potential cost savings from these initiatives like joint deployment are significant, the Commission should encourage and incent E-rate applicants and the communities they serve to employ these infrastructure initiatives.

IV. THE FCC SHOULD MAXIMIZE THE EFFECTIVENESS OF E-RATE FUNDS BY ENSURING GREATER AND MORE TIMELY ACCESS TO DETAILED DATA REGARDING THE E-RATE PROGRAM'S FUNDING COMMITMENTS (*NOTICE* SECTION IV)

In Section IV of the *Notice,* the Commission outlines a number of proposals that are aimed at maximizing the cost-effectiveness of E-rate funds. The success of all of these proposals – from encouraging consortium purchasing, to bulk buying, to improving the competitive bidding process – will depend on the timely access to detailed data regarding the E-rate programs funding commitments.

Connected Nation recommends that the Commission make data transparency a top priority of this debate. Indeed, Connected Nation believes that release of aggregate and localized information about E-rate's processes and impacts will by itself greatly benefit the program's intended beneficiaries, namely program participants, library patrons and students. Timely and public data will immediately improve the competitive bidding process, will provide benchmark

35 *See National Broadband Plan* at 114.

36 *Id.*

costs for certain technologies and network architectures, will uncover whether bulk buying opportunities may exist, and will also facilitate the creation of buying consortium because the buyers themselves will better be able to identify where such arrangements make financial sense.

A. THE POWER OF DATA TRANSPARENCY

The E-rate program today is hampered by a shortage of publicly available data regarding the direct services and products supported by the program and the impact that program funds have on schools, libraries, and their patrons. Since the Universal Service Administrative Company is charged with management of the E-rate program it is in the best position to release these much needed data. The Commission should direct USAC to undertake this challenge, and should work closely with USAC to ensure that it has the means to do so.

Data transparency is critical for several reasons:

- First, data is essential for program assessment. The public needs to understand what is being funded through the program in order to ascertain whether program goals are being met and assess the need for program redirection. Information such as broadband capacity at schools and libraries, or wireless capacity per student or library patron supported by the program, should be made readily available through national summary statistics as well as at a granular level through localized geocoded mapping tools.
- Second, data is essential to ensure equity of the program as ultimately defined by the Commission. The public needs to understand how funds are being distributed across eligible schools and libraries through national statistics, as well as at a granular level through localized geocoded mapping tools.

- Third, data is needed to inject competition into the E-rate system, encourage best practices, and reduce waste, fraud, and abuse. Transparent E-rate program data will benefit schools and libraries by encouraging a healthy debate regarding the types of services funded and the pricing of those services across comparable areas. These competitive forces will ensure a more efficient use of limited fund resources.
- And fourth, data is essential to understanding the true implementation costs of an E-rate program that will meet the goals set by the Commission in this proceeding. A key issue raised in this *Notice* is whether the E-rate fund cap needs to be raised. Yet, without tactical data of where we are today, we are unable to determine how much it will cost to get where we need to be.

At the center of nearly all of the Commission's questions in the *Notice* is the issue of data.

The *Notice* includes a myriad of complex questions relating to program goals and metrics, equity among the many eligible entities, and efficiency of the program in order to reduce bureaucracy and discourage waste, fraud, and abuse. The Commission should immediately begin to address this data gap, by working closely with USAC to review the data that is already in the system, but not currently made available to the public, and the data that is unavailable under existing processes. The Commission should consider amending the processes currently inhibiting data sharing.

B. DATA TO BE COMPILED AND RELEASED

Connected Nation proposes that the Commission and USAC work collaboratively and immediately to implement a program that collects and releases the following categories of data. Connected Nation also proposes ideas regarding the various formats and audiences for the data in question, and considers the potential burden on applicants. In most situations, the burden of these proposals on applicants will be minimal – the significant improvement in utility is gained through improved Commission and USAC processes and information technology systems.

1. Services Funded by E-rate

Current E-rate procedures make it impossible to answer basic questions, such as the total dollars invested through the program in broadband versus narrowband services, and estimates of the annual E-rate commitment to fund voice and other narrowband services. USAC does not release such fundamental program information.

USAC releases information regarding only four broad categories of funded services based on the data it collects from applicants through Form 471 and other program inputs. These categories include: Telecommunications Service and Internet Access[37] – both priority one services – and Internal Connections other than Basic Maintenance and Basic Maintenance of Internal Connections – both priority two services.[38] These four broad classifications include an

[37] While Internet Access includes services that could generally be classified as broadband related, Telecommunications Service includes an assortment of services that include narrowband voice, but could include other non-voice related services, such as dark or lit fiber. *See* Universal Service Administrative Company, Schools and Libraries Universal Service Support Mechanism: Eligible Services List (Sept. 27, 2012)2013 Eligible Services List *available at* http://www.usac.org/_res/documents/sl/pdf/ESL_archive/EligibleServicesList-2013.pdf ("Eligible Services").

[38] UNIVERSAL SERVICE ADMINISTRATIVE COMPANY, INSTRUCTIONS FOR COMPLETING THE SCHOOLS AND LIBRARIES UNIVERSAL SERVICE SERVICES ORDERED AND CERTIFICATION FORM at 21, *available at* http://www.usac.org/_res/documents/sl/pdf/forms/471i_fy05.pdf. ("FCC Form 471").

assortment of eligible services that do not fall into any manageable category such as voice services or broadband capacity. In some cases, the same service –such as dark or lit fiber—is reported under different categories of E-rate services based solely on whether the service provider is a telecommunications common carrier or not. In other words, based on regulatory definitions that have little to do with what policymakers, E-rate program stakeholders, and school and library administrators care about.[39] Moreover, when an application includes services that fall under more than one of these categories, the full amount committed through that application is classified under the category that has the greatest weight in the application.[40] For these reasons, the aggregate data regarding funding commitments currently released by USAC does not help address basic policy questions such as what is the total amount of funds committed under E-rate to support broadband services.

Connected Nation commends the Commission for recognizing the current shortcomings and proposing a revamp of the E-rate services data collected and released. But this reform needs to happen immediately because that data is important to helping the Commission, E-rate recipients, and the public analyze and assess the impact that proposed changes would have on the current E-rate program.

Connected Nation recommends that the Commission, working closely with USAC, undertake a review of existing information technology constraints inherent in today's E-rate

[39] See 2013 Eligible Services List available at http://www.usac.org/_res/documents/sl/pdf/ESL_archive/EligibleServicesList-2013.pdf.

[40] For example, if an application includes Internet Access services for 55% of its request, while 45% for Telecommunications Service, the total amount is classified as Internet Access. Examples of publicly available data on current funding commitments are available on USAC's commitments search page. UNIVERSAL SERVICE ADMINISTRATIVE COMPANY, SEARCH COMMITMENTS, http://www.usac.org/sl/tools/commitments-search/Default.aspx (last visited Sept. 16, 2013).

processes that prevent USAC from mining these data, and devise a plan to overcome such barriers in short order. The reform should ensure that E-rate will be readily available through national and state statistics, as well as at the local and applicant level. The type of information that should be disclosed will depend on the Commission's decisions in this docket regarding eligible services. Notwithstanding this reform, the Commission should ensure that the data collection will be granular and processing system flexible in order to allow for USAC to aggregate data of funding commitments for each service into categories that are meaningful to the general public, such as:

- Broadband access to the premise by any capacity tiers the Commission may choose to define (such as those currently included in Form 471);
- Wireless connectivity (such as WAN or other) within the school or the library– again at different service levels as defined by the FCC;
- Mobile wireless connectivity for educational purposes;
- Voice services provided through fixed, mobile and VoIP; or
- Other narrowband services.

The technology education sector is changing rapidly. The Commission should therefore ensure that the system is flexible enough to allow for the release of data under additional categories. Data deemed unnecessary today might be essential to policy decision makers and E-rate stakeholders in the near future. Below, we propose suggestions that address the need for this flexibility.

Connected Nation's data collection and release proposal will reduce, not increase, the burden on E-rate funding applicants. USAC can and should be in a position to sort each eligible service and product included in applicants submissions into the predetermined categories as defined by the Commission. As is further discussed below, USAC already collects information

from applicants regarding each service or product included in a funding application in item 21 of Block 5 of the Form 471. This disaggregate information includes product and service specifications, as well as pricing information.[41] While Connected Nation encourages the Commission and USAC to reform how these data are collected, as further discussed below, there is no need to further burden applicants by requiring additional information. Applicants should not have to worry about checking a specific box defining whether all or a portion of an application would fund "narrowband services" or "broadband service at speeds of between 50 Mbps and 100 Mbps." That should be done transparently by USAC when it receives and processes an E-rate application from that applicant.

2. Data that Supports Impact Analysis of School & Library Technology Platforms Funded by E-rate

In the *Notice*, the Commission also rightfully identifies a critical shortage of data under current E-rate procedures as to the impact that the program is having across schools and libraries. Today the Commission and USAC are unable to determine what broadband capacity exists to the premise or what wireless capacity is available within schools and libraries supported by E-rate. This tactical information is essential to the debate at hand. In fact, we cannot determine a price tag for the Commission's ultimate goals for the new E-rate program, or for the President's ConnectED initiative, without this information.

Connected Nation recommends that the Commission, working closely with USAC, undertake a comprehensive review of the data currently collected by USAC that provides

[41] "Each Funding Request must include a description of the products and services for which discounts are being sought. This description is known as an "Item 21 Attachment." The Item 21 Attachment is a detailed and complete narrative description of the products and services contained in the funding request and a line-item listing of the products and/or services requested with their associated costs, including make, model number and location of any equipment." *See FCC Form 471*, http://www.usac.org/_res/documents/sl/pdf/forms/471i_fy05.pdf.

information regarding funding levels. To be sure, some of this information already exists in USAC's system. Under Item 21 of Block 5 of Form 471, applicants for E-rate funds are required to submit detailed information regarding "the products and services contained in the funding request and a line-item listing of the products and/or services requested with their associated costs, including make, model number and location of any equipment."[42] The goal of such a review should be the release of timely data by USAC regarding the capacity and services supported by the E-rate program. Examples of such data should include, but not be limited to:

- Broadband capacity to the premise by various speed tiers as defined by the Commission;
- Wireless broadband capacity available at the school or library premises;
- Type of platform;
- Wireless capacity available per student or teacher for online access to educational-centered devices;
- Number of devices used for educational purposes connected via wireless capacity;
- Number of devices used for educational purposes connected via wireline capacity;
- Number of classrooms connected to broadband by speed tier; and
- Number of fixed and mobile voice lines supported.

Importantly, applicants need not bear significant additional burden in achieving these goals. Form 471 Item 21 already contains much of this information. Today, this information is collected in a non-standardize format, making data-mining costly. Hence, the burden of addressing this deficiency is not on the applicants, but rather on the Commission and USAC. A comprehensive review of current data systems of the E-rate program is necessary to understand how to fix this and what it would cost. Below we provide preliminary insight into such a process.

[42] *Id.*, *see also* UNIVERSAL SERVICE ADMINISTRATIVE COMPANY, APPLYING FOR DISCOUNTS http://www.usac.org/sl/applicants/step04/item-21.aspx (last visited Sept. 16, 2013).

3. Detailed Information on Applicant's Product and Service Purchasing Decisions

Connected Nation believes that the Commission and USAC have the power to inject a healthy dose of competition into the E-rate services and products market through the release of timely data regarding the actual technology funded through the program, including service and product specifications and pricing. Data transparency will help applicants better understand what technology their peers are choosing to invest in and at what prices. It will spur a number of healthy market forces including best practices regarding what technology does and does not work across schools and libraries, and what range of prices are fair across areas with similar characteristics. From a competitive standpoint, it will encourage vendors to be aggressive in meeting market trends.

The impact that such data would have in the program and across the education and library sectors should not be underestimated. A transition is currently underway; schools and libraries are forced to increasingly consider complex technology options they may not fully understand. A publicly available database would allow schools and libraries to assess the choices made by similar entities.

Publicly available data would also enable benchmarking of product specifications, including prices, and identification of outliers. Such process would impact the integrity of the program and reduce fraud, waste, and abuse. Indeed, it is arguable that by enabling granular data transparency the need for the complex and time-sensitive process applicants currently experience could be eliminated. Today USAC rules are very strict regarding the release and timeframe for competitive bidding for each and every service funded via E-rate. This complex process is at the core of much of the burden currently imposed on applicants – and also potential bidders to

provide those services – to the E-rate program. Connected Nation believes that the competitive bidding process would be more efficient were the Commission and USAC to release more timely information on the services and contracts entered into that are receiving E-rate subsidies. This would inject competitive forces into the system, allow potential buyers to better see and assess the range of prices and services in the market, and provide information to potential rival bidders. Further, as the Commission proposes in the *Notice*, the release of pricing information on services and products funded via E-rate would make compliance with the Commission's lowest corresponding price rules significantly easier to implement.

Once again, achieving these goals need not impose additional burdens on applicants. The information is already being collected by USAC through Item 21 of Form 471, and other forms. Item 21 is by and large collected in a non-systematic format (typically in the form of PDFs of vendor contracts), and therefore not amenable to data mining and additional analysis. Connected Nation recommends that the FCC, working closely with USAC, undertake a review of the IT systems and processes currently used to process these data. Such a review should contemplate different models that will ultimately enable the *flexibility* necessary for the Commission and USAC to produce data outputs such as those outlined in the following subsection.

Connected Nation is confident that if such review were completed, the burden of providing detailed information on the services funding request would be highly simplified. The process today is archaic and burdensome. Applicants are able to submit services funding request information as an attached PDF file – which makes it difficult to systematically review and compile product and service lists across applicants. Product and service providers, on the other hand, are invited to identify services and equipment schools and libraries may choose to include

in their E-rate application in the Eligible Products Database, available via a cumbersome Excel file. The Eligible Products Database is a pilot program that will provide a list of eligible products to applicants and the public.[43]

Neither of these approaches is optimal. As the Commission and USAC undertake this IT data review, Connected Nation recommends they explore online data input models, such as those commonly used by online retail platforms that enable both vendors and users to plug information into the system in a standardized format with minimal overview from the system administrator. In this manner, manufacturers and providers can populate online eligible services for inclusion in E-rate applications similar to vendors choosing to sell via Amazon, eBay, or other online commercial platforms. Applicants would be able to search through the database and select the items they want to include in their application in the same way that shoppers can easily sort through vast amounts of purchasing options available through online retail platforms.

4. Data Visualization

Having outlined principles for the types of data that the Commission and USAC should strive to release, Connected Nation wants to provide some preliminary ideas regarding data visualization to best serve policymakers, E-rate applicants and product service providers, and the public at large. For all of the above types of data, Connected Nation recommends consideration of the following data outputs:

- Statistics regarding average, median, maximum, and minimum information regarding services funded via E-rate;

[43] UNIVERSAL SERVICE ADMINISTRATIVE COMPANY SCHOOLS AND LIBRARIES. PRODUCTS DATABASE – MANUFACTURER AREA, https://slpin.universalservice.org/mfpin/sp/pinarea1.aspx (last visited Sept. 16, 2013).

- Average, medium, minimum, and maximum statistics regarding service and product specifications funded through the program (i.e., broadband capacity at school and libraries premises, prices paid by type of service or product, etc.);
- Data across comparable cohorts or regions of particular interest to policy makers (i.e., average broadband capacity and pricing across institutions in rural and remote, insular, low income areas, etc.);
- Estimates of E-rate beneficiaries contracting eligible services at speed tiers, technology platforms, and other service specifications defined by the FCC (i.e., percentage of schools and libraries using broadband at various speed tiers);
- Data should be released at multiple levels of disaggregation including: nationally, state, region, county, and school district; and
- Where possible, data should also be provided for each applicant and recipient of funding (where the recipient is part of a consortium or school district or library system).

It is important to note that the Commission and USAC could include additional data outputs as needed for future policy debates. In other words, such outputs need not be set in stone at this time. If the FCC and USAC were to undertake a comprehensive assessment of E-rate's current IT systems and given appropriate input of data, obtaining such output data on a timely basis would not be burdensome.

In addition to such standard data outputs, Connected Nation recommends that the Commission and USAC assess the possibility of using GIS file formats to release multiple layers of data on the E-rate program using highly intuitive and user-friendly GIS web maps. In recent years the Commission has been increasingly reliant on GIS mapping tools to release vast amounts of tactical data to the general public. In 2011, the NTIA State Broadband Initiative and the Commission released the first National Broadband Map.[44] Since then, the FCC has continued to mine existing databases to produce timely GIS maps regarding key policy procedures

[44] *See* http://broadbandmap.gov/ (providing address search).

underway.[45] This vast effort by the FCC is paying off. The relatively user-friendly platform is injecting transparency into the FCC rulemaking process, providing information that was previously difficult to obtain by stakeholders throughout the country.

This new vision for data transparency at the FCC is promoting a healthy debate regarding the state of broadband across the nation at the federal, state, and local level. Indeed, thanks to the National Broadband Map, citizens, elected officials, and broadband stakeholders in Missaukee County, Michigan know that, as of December 31, 2012, an estimated 84.3% of county population had broadband service available at download speeds of 6 Mbps or more, ranking 60 across a total of 83 counties in the state.[46] Why is similar connectivity data for the Missaukee County schools and libraries receiving E-rate funds not regularly and routinely published by the Commission and USAC? Connect Michigan[47] uses the broadband availability data to help that community set in place general community-wide broadband connectivity goals that will support economic development and residential quality of life. [48] Those programs would be even better were school and library connectivity and price data – connectivity that the E-rate pays for – available for examination by these local stakeholders.

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45 FEDERAL COMMUNICATIONS COMMISSION, MAPS, http://www.fcc.gov/maps (last visited Sept. 16, 2013).

46 NATIONAL BROADBAND MAP, ANALYZE, http://broadbandmap.gov/ (last visited Sept. 16, 2013).

47 Connect Michigan is a subsidiary of Connected Nation. The Connected[SM] Community Engagement program in Michigan is funded through an SBI grant administered by the NTIA. *See* CONNECT MICHIGAN, YOUR COMMUNITY, http://www.connectmi.org/your-community (last visited Sept. 16, 2013).

48 Such tactical information represents a lifeline for broadband stakeholders in the county who are working to coordinate local efforts to ensure expansion of broadband access, adoption and use through their community. In August 2013, supported by Connect Michigan's Connected[SM] Community Engagement program, the county unveiled its Technology Action Plan. Using National Broadband Map data as its foundation, the plan sets general community-wide broadband connectivity goals that will support economic development and residential quality of life. For more information on this local planning effort. Press Release, Connect Michigan, Missaukee County Launches Technology Action Plan (Aug. 16, 2013) *available at* http://www.connectmi.org/recent-news/missaukee-county-launches-technology-action-plan-0.

Connected Nation submits that, through the release of similar GIS mapping tools, the FCC and USAC have the power to inject vibrancy into the fast-changing industry of information technology that serves schools and libraries. Examples of data disclosed through such platforms include:

- Maps depicting statistical information regarding the program's impact (i.e., average broadband capacity across E-rate recipients by county);
- Maps showcasing recipient specific information within an interactive online mapping application where users can select a school or library location and enable a pop-up window containing various attributes (i.e., actual broadband capacity at the premise, wireless capacity, number of phone lines, complete list of services and products funded through E-rate, etc.); and
- Datasets available for download in a GIS format (shapefile) and spreadsheet format (Excel and/or .csv file) to enable third parties to conduct various analyses in combination with other datasets.

V. CONCLUSION

Broadband and mobile technologies are revolutionizing the manner in which teachers teach, students learn, and adults gain new skills that will help them in the workforce. The question in this proceeding is not whether this revolution in education will happen – the question is whether the Commission will be bold enough to establish an E-rate program aimed to ensure that all students and lifelong learners in the United States will have adequate and sufficient access to these revolutionary educational tools.

In these Comments, Connected Nation recommends that the Commission prioritize funding for high-speed broadband connectivity inside schools and libraries **and** mobile broadband access to educational devices used by students and educators. The Commission also should incentivize cost-effective infrastructure investments by promoting community technology planning, which will facilitate opportunities for cost-sharing with other state and federal

infrastructure projects, such as road construction, Connect America Fund, and BTOP network upgrades. Finally, Connected Nation recommends a number of methods in which the Commission and USAC can promote cost-effective E-rate purchasing decisions simply through the collection, release, and visualization of data. The Commission and USAC have a wealth of data at their disposal that would be extremely useful to E-rate applicants were it more regularly released and presented. Connected Nation believes that these proposals will help the Commission meet its goal of ensuring that the E-rate program meets the broadband challenge that the nation's libraries and schools now face.

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